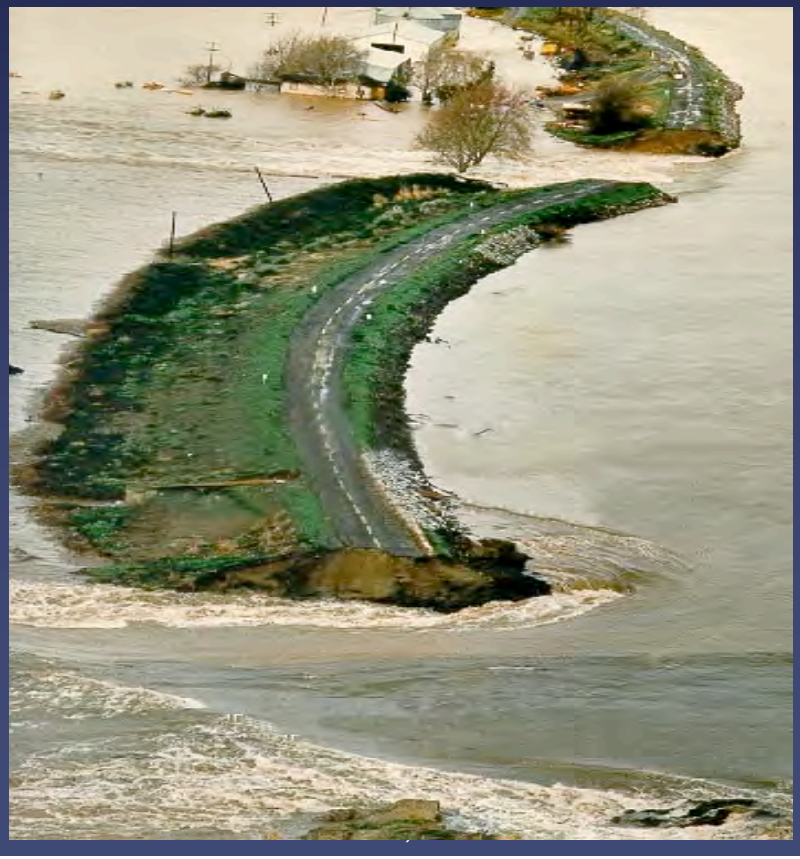
Senate Subcommittee on Delta Resources
Senate Transportation and Housing Committee
Joint Committee on Emergency Services and Homeland Security

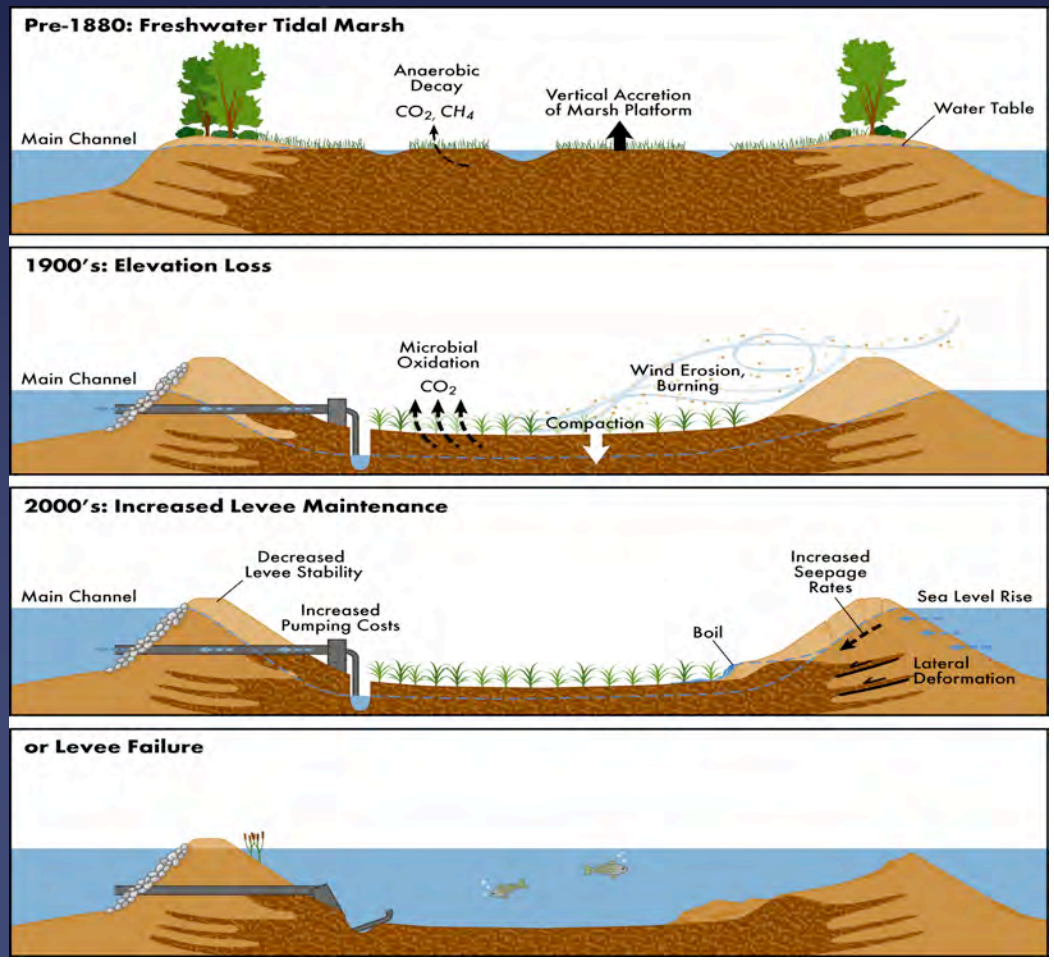
Thinking the Unthinkable – Are We Ready for Major Floods in the Delta?
Interim Hearing

How a Delta Earthquake Could Devastate California's Economy



PRESENTATION OUTLINE

- **Why this Scenario needs to be Considered**
- **When the Delta Fails**
- **Initial Impacts**
- **Extended Impacts**
- **Long-term Costs**



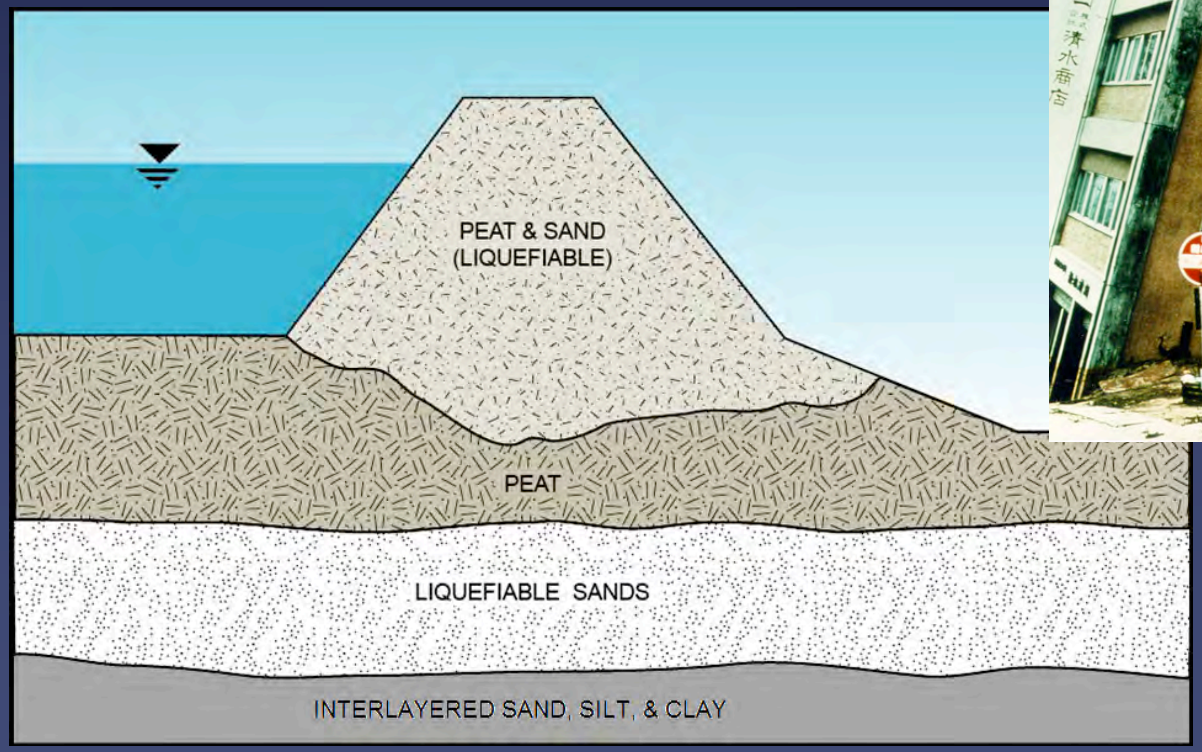
•Graphic courtesy of Dr. Jeffrey Mount

Why this Scenario needs to be Considered

- Supplies water to more than 22 million Californians, industry and agriculture
- Water supply supports $400 billion state economy
- Home for more than 400,000 people
- Habitat for 500 species
- Highways, pipelines, power distribution, railroads, and deep water ports

Why this Scenario needs to be Considered

- PL84-99 levee improvements would cost $1.3 billion
- Levees remain susceptible to earthquakes even after PL84-99 improvements are made

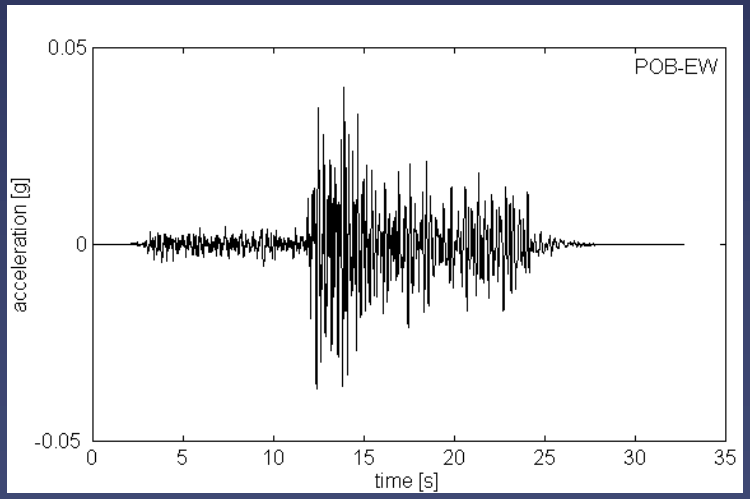


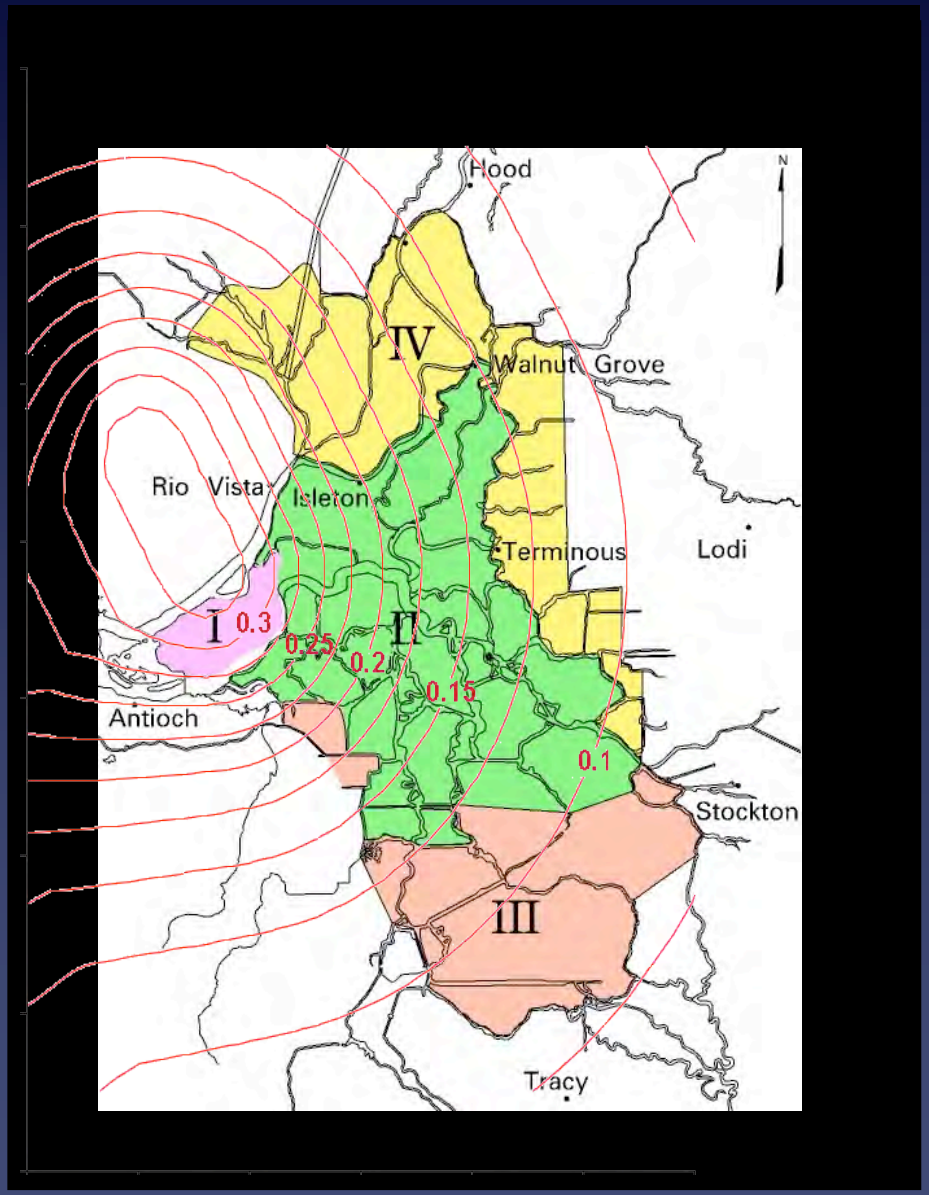
Why this Scenario needs to be Considered

- Delta lies east of numerous active earthquake faults
- Loss of life from flooding and earthquake

When the Delta Fails

- Hypothetical magnitude 6.5 earthquake near the western edge of the Delta





When the Delta Fails

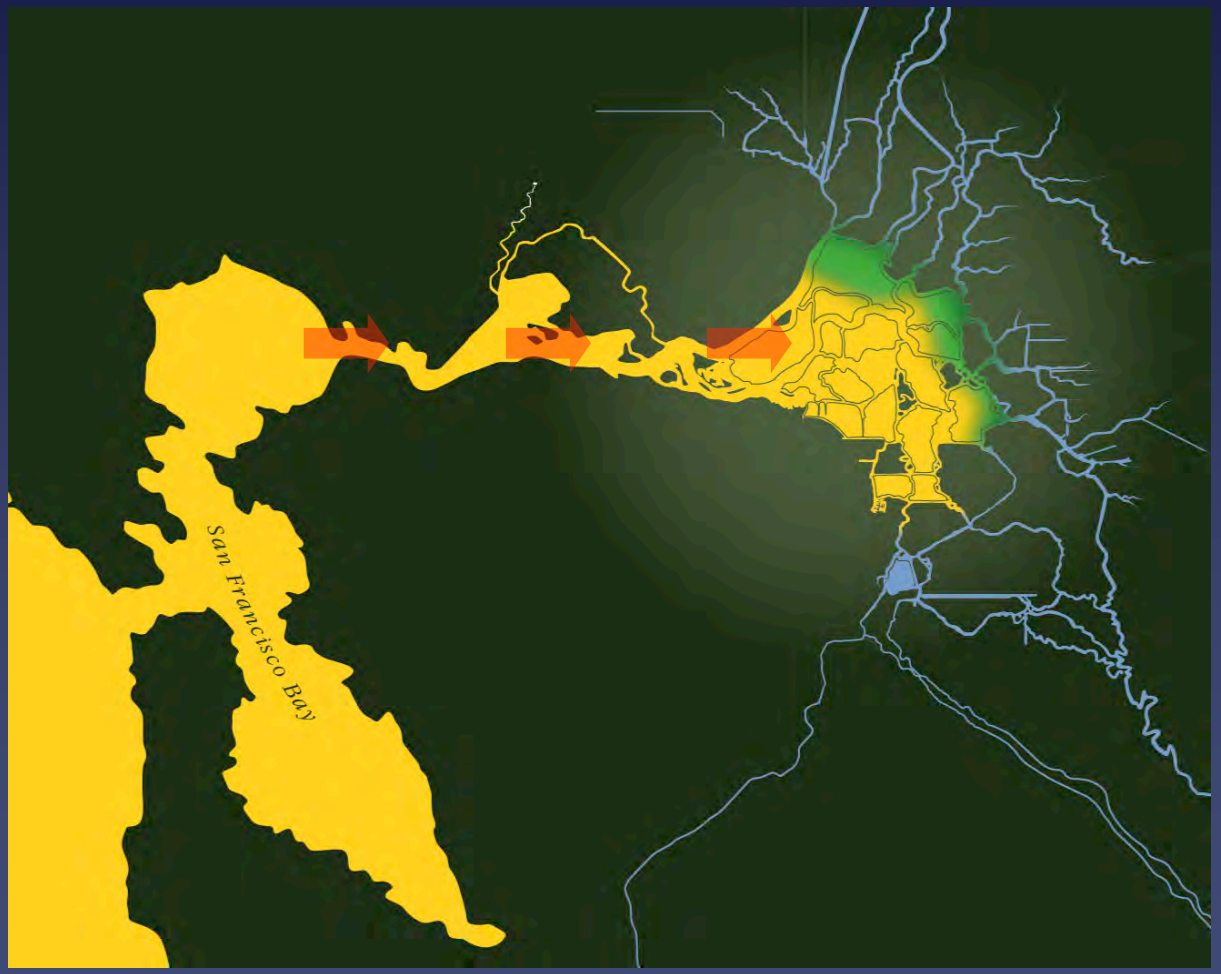
- 30 levee breaches
- Flooding of 16 islands

When the Delta Fails

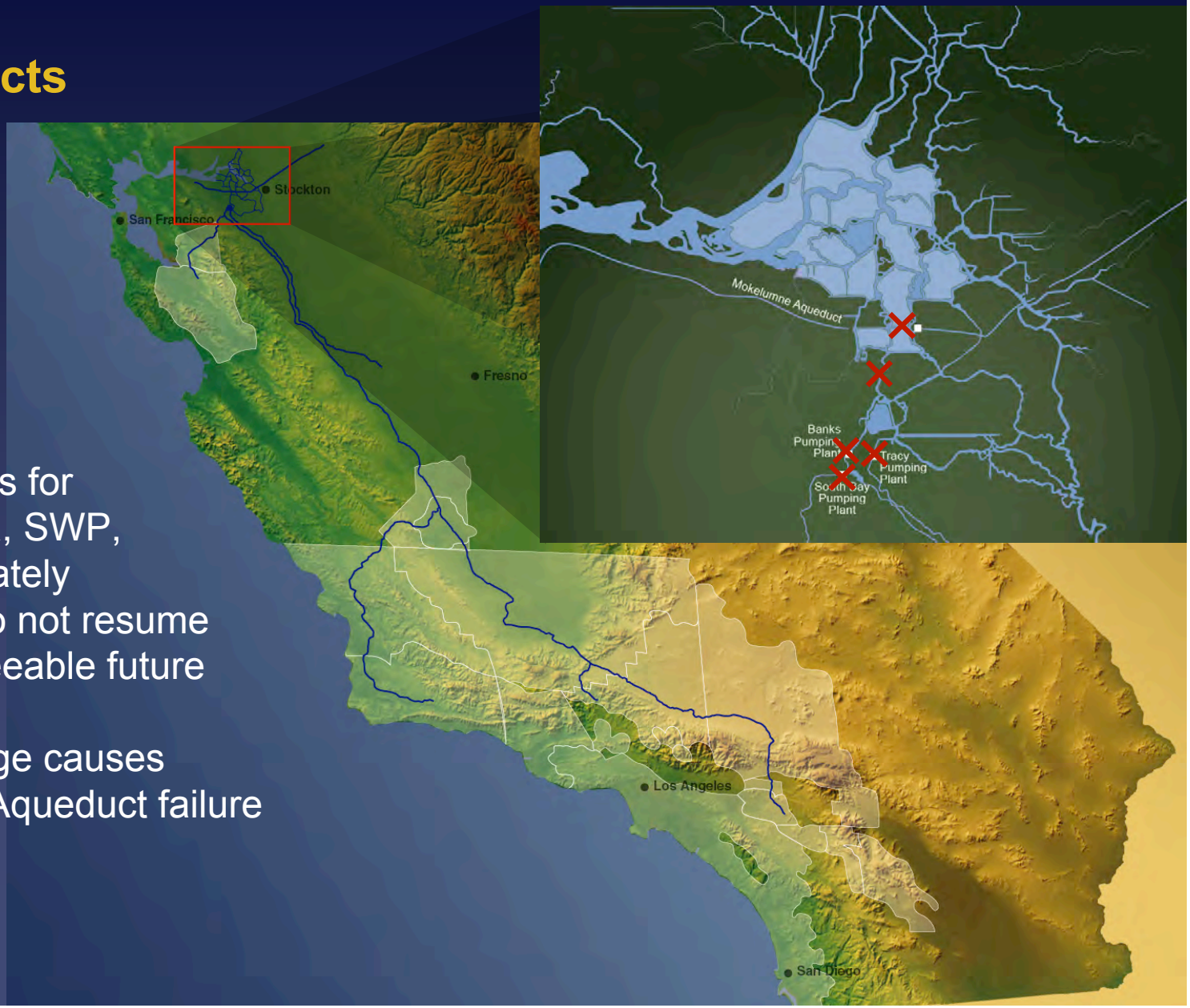
- In addition to 30 levee breaches, 200 miles of levees are weakened by slumping, cracking and increased seepage
- Without repairs these damages will lead to additional levee failures

When the Delta Fails

- 300 billion gallons of salt water flow into the Delta in first few days



Initial Impacts



- Water exports for Contra Costa, SWP, CVP immediately cease and do not resume for the foreseeable future
- Levee damage causes Mokelumne Aqueduct failure

Initial Impacts

Infrastructure Failures:

- Highway 160 flooded
- Highway 12 flooded
- Natural gas and oil pipeline ruptures
- Railroad embankment failure

Resulting In:

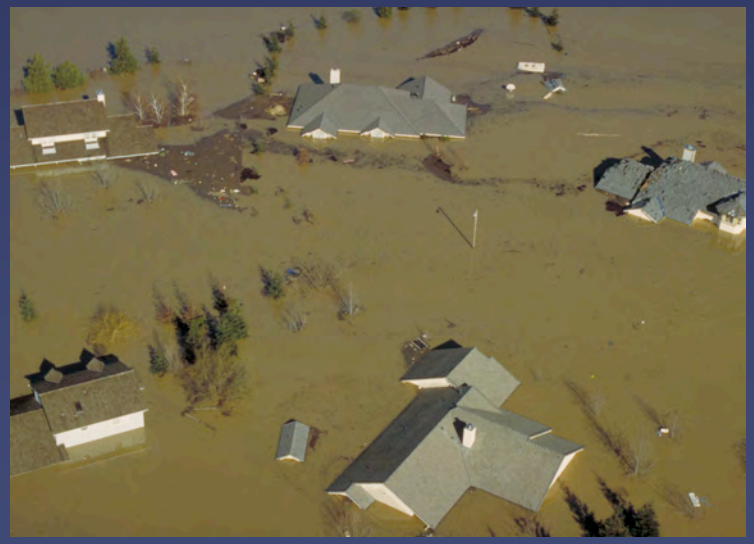
- Major transportation disruption in Bay-Delta region
- Interruption of rail and truck deliveries
- Shortage in natural gas
- Hazardous spills and cleanup

Initial Impacts

- Some levee and submerged slope failures partially block Stockton Deep Water Channel — Port of Stockton shut down until dredging reopens the channel

Initial Impacts

- As many as 85,000 acres of agricultural land and crops flooded
- As many as 3,000 homes inundated



Initial Response

- Command posts established in Rio Vista, Stockton and Antioch
- Coast Guard, National Guard, Sheriff, and Police helicopters conduct rescue operations
- SEMS teams mobilize CDF and CCC crews to lay plastic and sandbags to reduce wave wash erosion using approximately 1,500 people
- Access to islands is very limited and significantly inhibits emergency response efforts

Initial Response

- Flood fights on adjoining non-flooded islands due to increased seepage
- All available barge-mounted cranes in Bay-Delta region mobilized for emergency response to armor edges of 30 breaches
- Additional barge-mounted cranes, tugs, and barges must be requested from Long Beach and Seattle
- Time for additional floating equipment to arrive is estimated to be 2 to 4 weeks
- Damage to refineries, bridges and other infrastructure competes with Delta for response assets

Extended Impacts

Water Availability

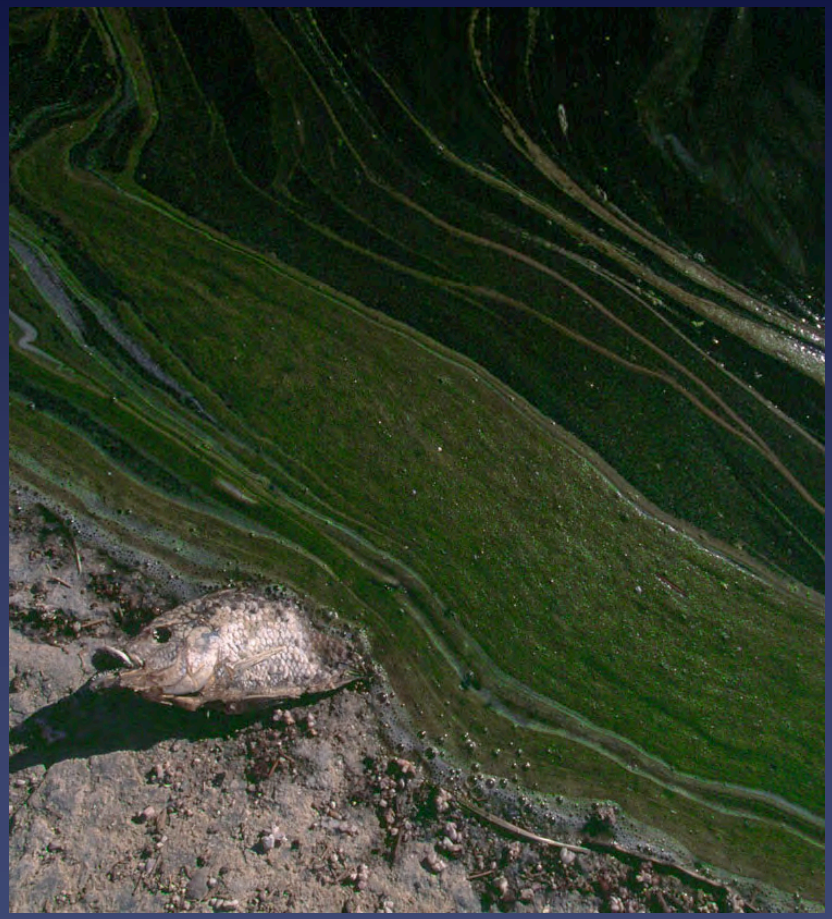
- Using most optimistic projection, levee repairs will require at least 15 months. More realistically, the repairs will take much longer.
- Southern California water agencies are drawing from reserves. Some will last up to 36 months; others will go dry sooner.
- Extreme water conservation measures enacted
- Ground water basins drawn dangerously down – may lead to contamination
- Water conservation and transfer programs enacted

Extended Impacts

Water Quality:

- Brackish water remains in deep pools along remnant levees

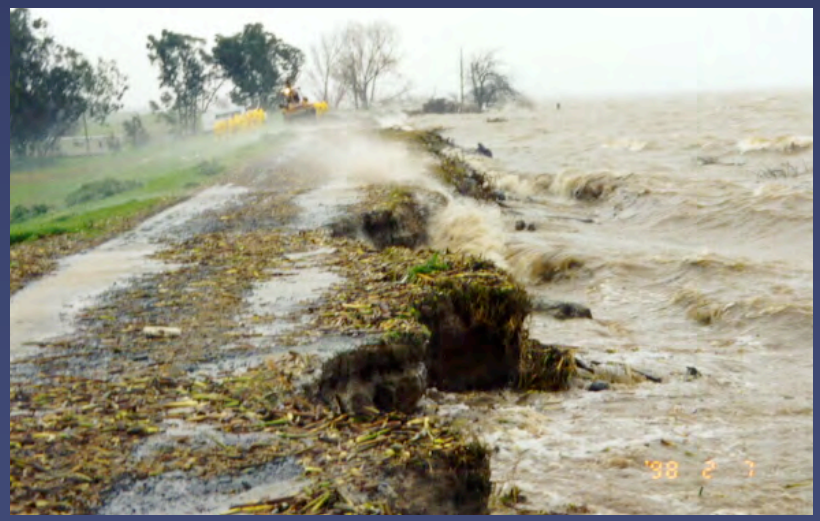
- Impact to endangered species and food chain unknown, but it is expected that some species would benefit and others would be severely hurt.



Extended Impacts

One Year Later:

- Efforts to close breaches are incomplete
- Additional earthquake-damaged levees (cracked, slumped) have now failed because there were not ways to provide equipment and materials to repair them.
- Wind-driven waves have eaten away 20% of the levees on 9 islands.
- There are now more breaches and damaged levees than immediately after the earthquake.
- DAMAGE IS AT LEAST $6 BILLION



Extended Impacts

Initial Water Supply Response:

- After a year of efforts, only 7 islands have been saved. Additional efforts to recover islands are abandoned.
- Instead, rock barriers are placed in various waterways to reroute portions of the San Joaquin River to the SWP and CVP pumps. It takes 1 month and 130,000 tons of rock to complete these barriers.

Long Term Costs

To California Businesses:

- The Delta has been modified to deliver lesser quality San Joaquin River water, and at lower delivery amounts. Water treatment costs remain high due to increased salinity and carbon content.
- Delta and State agriculture is greatly impacted
- Traffic into and around the Bay-Delta region remains significantly impacted
- Many businesses around the periphery of the Delta are greatly impacted – some go out of business
- Total costs to California's economy could be $30-40 billion in the first five years.
- Total job loss exceeds 30,000

Long Term Costs

To Delta's Natural Resources:

- After 18 months, much of the central Delta is a brackish waterway, with remnant levees.
- Unknown environmental impacts to Delta ecosystem
- Recreation is greatly reduced

Department's Initiatives

- Flood Management White Paper (January 2005) recommendations included:
  - Prioritizing Delta levees to be protected
  - Providing for emergency response in the Delta
- Interim Emergency Response Plan (being finalized)
- Delta Risk Management Strategy (initiated February 2005):
  - Improved assessment of levee risks and impacts
  - Developing risk reduction strategies
- Central Valley Flood Management Reform Legislation:
  - AB 1665
  - ACA 13
- Delta levee evaluation - DWR and DFG (AB 1200)